

## ABSTRACT OF THE DISCLOSURE

The invention is for a DNA vaccine expressing the hemagglutinin (HA1) gene of equine-2 influenza virus. By engineering a stop codon within HA1, expression of HA1 is ensured. By encapsulation of the DNA vaccine in liposome and by intranasal inoculation, it is sufficient to elicit protective immunity at a significantly lower dosage compared to a DNA vaccine expressing the full length HA gene. Lower dosage reduces the risk of induction of anti-DNA antibodies. Intranasal inoculation directly to the respiratory epithelial cells reduces the risk of DNA integration. The inventive vaccine is advantageous over current inactivated or live attenuated vaccines, as updating of the vaccine requires only the replacement of the encoding sequence with the new virus.

W256567.1